

Bempton Primary School

# Science Curriculum



# Intent

Science plays a central role within the curriculum at Bempton and is fundamental to our mission of creating aspirational and knowledge-rich pupils. Pupils are encouraged to be curious, ask questions about what they observe and will help to understand scientific the world around them by using different types of enquiries to answer their own questions. Our Science curriculum is ambitious and sequenced coherently so the interplay between substantive knowledge and disciplinary skills builds through the three discrete distinct disciplines of biology, chemistry and physics. As a result of the accumulation of essential knowledge and skills, pupils' science capital and scientific understanding will be substantial and provide a secure foundation that will enable them to succeed in the next stage of their education.

Our Science curriculum aims to ensure that all Pupils develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. Our pupils are equipped with the scientific knowledge required to understand the uses and the implications of science in the past, present and for the future.

Our curriculum plan has been designed and built with clear schemes of work for each year group and each subject. The plan allows for spiral learning avoiding unnecessary repetition but recapping what has gone before and moving learning on. Sequences of learning are also carefully planned for so that there is a natural flow between units of learning.

## **At the end of Foundation at Bempton:**

Pupils are taught -

- Pupils will gain a secure understanding of what science is, and to be introduced to the world around them through science.
  - Pupils will develop scientific vocabulary and language.
- Furthermore, they will begin to explore investigations to ensure a strong foundation of science vocabulary and language.

## **At the end of KS1 at Bempton:**

Pupils are taught -

- Pupils will develop their understanding of scientific ideas by using different types of scientific enquiry to ask their own questions, observe changes over time, notice patterns, grouping and classifying and carrying out simple comparative tests. They will continue to build on their scientific language and communicate their ideas to a range of audiences in a variety of ways

## **At the end of KS2 at Bempton:**

Pupils are taught -

- Pupils will be able to develop a deeper understanding of a wide range of scientific ideas. They will do this through exploring and talking about their ideas, asking their own questions about science of the past, present and future. They will analysing functions, relations and interactions more systematically. They will have encountered more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.

# Implementation

- Science units are separated into Biology, Chemistry, Physics and Earth Science for each year, according to the National Curriculum.
- Subject specific vocabulary is selected and taught within lesson sequences.
- The Long-Term Plan ensures that pre-requisite knowledge and skills are considered and linked to new learning.
- Opportunities to revisit and retrieve prior learning are woven into sequencing and teaching and learning practice.
- Units of work are carefully sequenced, so prior knowledge and concepts are returned to and built upon from previous year groups and units. Knowledge Organisers are used (y1-y6) to pre-load learners before lessons to support vocabulary and key concepts.
- Science is taught weekly as a core subject (Y1-Y6) to ensure all of the above can be maintained.

Within our Science curriculum there are two main elements:

- **Knowledge and conceptual understanding.** This is sequenced and imparted via direct instruction, retrieval practice and explicit vocabulary teaching. It is vital that pupils gain a secure understanding of each block of learning to support progression, and a depth of understanding, as they progress through their learning.
- The process and methods of science (**working scientifically**) are not taught as a separate strand but instead, woven through every lesson. This enables pupils to develop their skills as a scientist through applying their knowledge and understanding to deepen their own scientific understanding using different enquiry types.

# Impact

## Assessment:

We use a multi-faceted approach to assessment within Science.

- We use retrieval questions at the start of every lesson to ascertain existing knowledge and to address misconceptions.
- End of lesson retrieval tasks are used to inform the teacher's assessment.
- Assessment for learning is used within each lesson through skilful use of questioning and in the moment feedback.
- Pupil voice is used to support the evidence that pupils know and remember more over time.
- Science experiments facilitate pupils to independently apply and explore the interplay between the appropriate substantive knowledge and disciplinary concepts. These begin in EYFS with teacher structured experiences and continue throughout every year group.

## Culture Capital:

Enrichment is an essential part of the Bempton Science curriculum which provides pupils with extended time to focus and deepen their learning.

We use a multi-faceted approach to enrichment within Science:

- British Science week
- STEM summit challenges with our local science hub of primary and secondary schools
- Live links with engineers
- Local studies with Bempton Bird Sanctuary
- Local studies at Bempton pond.

**Career Professional Development:**

To engage and empower staff and develop their confidence within science, we are actively seeking out new experiences and opportunities to develop our subject knowledge. This is ongoing and has been done in a variety of ways, such as:

- Through observing STEM professionals and building relationships with them
- Science lead booking staff on CPD
- Emailing out STEM training opportunities and providing these when possible
- Encouraging ECTs to observe more experienced teachers
- Encouraging teachers to have an awareness of where their classes learning is going (the next year group)

	2022-2023 / Cycle A						2023-2024 / Cycle B					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Class 4	Electricity (6)	Light (6)	Evolution and Inheritance (6)	Animals inc Humans/ Living things and their habitats (5) – Life progresses and life cycle.	Living things and their habitats- Micro Organisms (6)		Earth and Space (5)	Forces (5)	Properties and changes of materials (5)	Living things and their habitats- classification (6)	Animals inc Humans (6)	
Class 3	Forces and magnets (3)	Electricity (4)	Sound (4)		Animals including Humans (4)	Plants (3)	Rocks (3)	Light (3)	States of matter (4)		Living things and their habitats (4)	Animals including humans (3)
Class 2	Seasonal change (Y1)	Animals inc Humans (Y1)	Materials (Y2)	Animals inc Humans (Y1)	Plants (y1)	Living things and their Habitats (Y2)	Materials (Y1)	Animals inc Humans (Y2)	Living things and their Habitats (Y2)	Seasonal change (Y1)	Plants (Y2)	
Class 1	Senses	States of matter	Weather / Seasons	Forces	Materials	Living things						

# Progression

## Working Scientifically

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<p><u>Understanding the World</u></p> <p>Explore the natural world around them. Describe what they see, hear and feel whilst outside.</p> <p>ELG: The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants</p>	<p>Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.</p> <p>Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science.</p> <p>Know that we can use magnifying glasses to observe objects closely</p> <p>Know that we can test our questions to see if they are true.</p> <p>Know that objects can be identified or sorted into groups based on their observable properties.</p> <p>Know that we can write down words</p>	<p>Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.</p> <p>Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science.</p> <p>Know that we can use magnifying glasses to observe objects closely.</p> <p>Know that we can test our questions to see if they are true.</p> <p>Know that objects can be identified into groups based on there observable</p>	<p>Know that we can ask questions and answer them by setting up scientific enquiries.</p> <p>Know how to make relevant predictions that will be tested in a scientific enquiry.</p> <p>Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same.</p> <p>Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches</p>	<p>Know that we can ask questions and answer them by setting up scientific enquiries.</p> <p>Know how to make relevant predictions that will be tested in a scientific enquiry.</p> <p>Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same.</p> <p>Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches.</p> <p>Know how to draw bar charts; how to label a</p>	<p>Know how to choose appropriate variables to test a hypothesis (e.g. plant height as a dependent variable when measuring effect of light on plant growth).</p> <p>Know how to identify conditions that were imperfectly controlled and can explain how these might affect results.</p> <p>Know how to accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device.</p> <p>Know how and when to repeat measurements, how to find an average of a set of measurements and</p>	<p>Know how to choose appropriate variables to test a hypothesis (e.g. plant height as a dependent variable when measuring effect of light on plant growth).</p> <p>Know how to identify conditions that were imperfectly controlled and can explain how these might affect results.</p> <p>Know how to accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device.</p> <p>Know how and when to repeat measurements, how to find an average of a set of measurements and</p>

	<p>or numbers or draw pictures to record what we find.</p>	<p>properties</p> <p>Know that we can write down words or numbers or draw pictures to record what we find.</p>	<p>Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key; how to draw a classification key; how to show relationships between the independent variable in a two-way table; and how to label specific results in a two way table.</p> <p>Know – with structured guidance – how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion.</p> <p>Know how to precis a scientific enquiry write- up into a brief oral discussion of what was found in a scientific enquiry.</p> <p>Know that scientific enquiries can suggest relationships, but that they do <u>not</u> prove whether a prediction is true.</p>	<p>diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table.</p> <p>Know – with structured guidance - how to write a simple scientific enquiry write- up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion.</p> <p>Know how to precis a scientific enquiry write- up into a brief oral discussion of what was found in a scientific enquiry.</p> <p>Know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true.</p> <p>Know that scientific enquiries are limited by the accuracy of the measurements (and</p>	<p>how to recognise and remove outliers from a set of data, justifying the removal as a potential mis-measurement.</p> <p>Know how to independently write a simple scientific enquiry write- up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion.</p> <p>Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary.</p> <p>Know examples of instances where scientific evidence has been used to support or refute ideas or arguments (e.g. fossil records as evidence of natural selection).</p>	<p>how to recognise and remove outliers from a set of data, justifying the removal as a potential mis-measurement.</p> <p>Know how to independently write a simple scientific enquiry write- up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion.</p> <p>Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary.</p> <p>Know examples of instances where scientific evidence has been used to support or refute ideas or arguments (e.g. fossil records as evidence of natural selection).</p>
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Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry.

Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc).

Know that they can draw conclusions from the findings of other scientists  
Know that a theory is an explanation of observations that has been tested to some extent and that a

measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry.

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Know that they can draw conclusions from the findings of other scientists.

Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry.



hypothesis is an explanation that has not yet been tested, but can be tested through a scientific enquiry,

**Physics**

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<p><u>Understanding the World</u></p> <p>Explore the natural world around them.</p> <p>Describe what they see, hear and feel whilst outside</p> <p>Understand the effect of changing seasons on the natural world around them</p> <p>ELG: The Natural World</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>			<p><b><u>LIGHT</u></b></p> <p>Know that light is a form of energy.</p> <p>Know that we need light to see things and that darkness is the absence of light.</p> <p>Know that everything that we can see is either a light source or something that is reflecting light from a light source into our eyes.</p> <p>Know that light travels in straight lines know that light is reflected when it travels from a light source and then ‘bounces’ off an object.</p> <p>Know that everything that we can see is either a light source or something that is reflecting light from a light source into our eyes.</p> <p>Know that the Sun is a light source, but that the Moon is not and is merely reflecting light from the Sun.</p> <p>Know the dangers of looking at the sun.</p> <p>Know that sunglasses can protect eyes from sunlight but looking at the Sun directly – even with sunglasses – can damage the eyes.</p>	<p><b><u>SOUND</u></b></p> <p>Know that sound is generated when an object vibrates; some of the energy from the vibrating object is transferred to the air, making the air particles move.</p> <p>Know that sound travels through a medium (e.g. particles in the air) and thus sound does not travel through a vacuum which has no particles in it at all.</p> <p>Know the correlation between pitch and the object producing a sound.</p> <p>Know the correlation between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Know that sound gets fainter as the distance</p>	<p><b><u>EARTH AND SPACE</u></b></p> <p><b><u>FORCES</u></b></p> <p>Know that gravity is a force that acts between all objects in the universe, but that it acts much more strongly between objects that have more mass and that are close together</p> <p>Know that unsupported objects are pulled towards the Earth by the force of gravity.</p> <p>Know that air resistance is a force felt by an object as it moves through the air; it is caused by the object bumping into the gas particles that make up air; the quicker an object moves, the more gas particles it bumps into and the more air</p>	<p><b><u>LIGHT</u></b></p> <p>Know that light travels in Straight Lines</p> <p>Understand the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Know how our eyes work.</p> <p><b><u>ELECTRICITY</u></b></p>

			<p>Know that opaque objects block light creating shadows and that light passes easily through transparent objects.</p> <p>Know that opacity/ transparency and reflectiveness are properties of a material.</p> <p>Know that as objects move towards a light source, the size of the shadow increases.</p> <p>Know how to show the changing of shadow size by drawing a diagram with straight lines representing light.</p> <p><b><u>FORCES AND MAGNETS</u></b></p> <p>Know that a force can be thought of as a push or a pull.</p> <p>Know that objects move differently on rough and smooth surfaces; objects resist movement more on rough surfaces because there is higher friction as the object.</p> <p>Moves Know that there are also non-contact forces that can act between objects without them touching and that magnetism is an example of a non- contact force.</p> <p>Know that magnets have two poles called north and south.</p> <p>Know that like poles (south- south and north- north) of two magnets repel each other and that opposite poles of two magnets (north- south) attract each other.</p> <p>Know that some materials are magnetic, meaning that they are attracted to a magnet, while other materials are non-magnetic.</p>	<p>from the sound sources increases.</p> <p><b><u>ELECTRICITY</u></b></p> <p>Identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>resistance it experiences.</p> <p>Know that water resistance is a force felt by an object as it moves through water; it is caused by the object bumping into the water particles.</p> <p>Identify and know the effect of friction.</p> <p>Know that gears, levers, and pulleys are simple machines that are used to allow a smaller force to have a greater effect; they do this by moving a smaller force over a longer distance at one end of the machine, which the machine turns into a larger forcer over a small distance at the other end.</p>	<p>Know how to draw simple circuit diagrams.</p> <p>Know the recognised symbols for a battery, bulb, motor, buzzer and wire</p> <p>Know that the brightness of a bulb is associated with the voltage.</p> <p>Know how to predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit.</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p>
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## Chemistry

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<p><u>Understanding the World</u></p> <p>Describe what they see, hear and feel whilst outside</p> <p>ELG: The Natural World</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments (retrieval).</p> <p><b><u>MATERIALS</u></b></p> <p>Know that an object is made from/of a material and know some examples of materials in the real world.</p> <p>Know that materials can be hard, soft, strong, weak, absorbent, heavy, light, solid and runny, smooth and rough; these descriptions denote the properties of a material.</p> <p>Know from observation how to distinguish between materials made of wood, plastic, glass, metal, water, rock.</p>	<p><b><u>USES OF EVERYDAY MATERIALS</u></b></p> <p>Know that objects are made from materials such as wood, plastic, glass, metal, water, rock.</p> <p>Know that materials have properties such as being hard, soft, strong, weak, absorbent, heavy, light, solid, runny, smooth and rough; these descriptions denote the properties of a material.</p> <p>Know that materials can have useful properties for a given job (including being waterproof, strong, hard, soft, flexible, rigid, light or heavy).</p> <p>Know that many types of plastic are waterproof, that steel (a type of metal) is strong, that rock is hard, that cotton wool is soft, that rubber is flexible, that rock is rigid, that polystyrene (a type of plastic) is light and that iron (a type of metal) is heavy.</p> <p>Know that when objects move across a surface there is friction when they rub against each other and that sometimes this friction is larger or smaller (pre- load for Year 3 forces).</p> <p>Know that applying forces to objects can change their shape, by squeezing, stretching, bending and twisting.</p>	<p><b><u>ROCKS, FOSSILS AND SOILS</u></b></p> <p>Know that there are three kinds of rocks: igneous, sedimentary, and metamorphic.</p> <p>Know how fossils are formed.</p> <p>Know that soil is made from tiny particles of rock broken down by the action of weather (weathering).</p>	<p><b><u>STATES OF MATTER</u></b></p> <p>Know that materials can be grouped according to whether they are solids, liquids or gases and their differences.</p> <p>Know that materials can change state when temperature changes.</p> <p>Know that when solids turn into liquids, this is called melting and that the reverse process is called freezing (see diagram below).</p> <p>Know that when liquids turn into gases, this is called evaporation and that the reverse process is called condensation (see diagram below).</p> <p>Know that when a solid turns into a gas without passing through the liquid state, this is called sublimation (see diagram below).</p> <p>Know that the melting point of water is 0o C and that the boiling point of water is 100o C.</p> <p>Know that water flows around our world in a continuous process called the water cycle (see diagram below).</p> <p>Know that, along with evaporation, water on the Earth's surface moves to the air in a process called transpiration in which water turns into water vapour (gas) on the surface of leaves on plants.</p>	<p>Retrieval to consolidate Year 4 States of Matter.</p> <p><b><u>PROPERTIES AND CHANGES OF MATERIALS</u></b></p> <p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p>	

		<p>Know that Isambard Kingdom Brunel was a famous scientist who used materials to build impressive and important things; know that he was an engineer.</p> <p>Know that Brunel lived in the Victorian era and that he designed steamships, railways, bridges, tunnels and# dockyards.</p>		<p>Know that rain condenses in clouds and falls to earth as rain, snow or hail in a process called precipitation.</p>	<p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>	
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Biology						
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<p><u>PSED</u></p> <p>Manage their own needs. (Personal hygiene)</p> <p>Know and talk about the different factors that support their overall health and well-being.</p> <p><b>ELG: Managing Self</b></p> <p>Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices</p> <p><u>Understanding the World</u></p>	<p><b><u>ANIMALS INCLUDING HUMANS</u></b></p> <p>Know that a trout is an example of a fish; a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammal and explore further examples of each animal type.</p> <p>Know that herbivorous animals eat plants; carnivorous animals eat other animals; omnivorous animals eat both animals and plants (know different animals from eat category).</p>	<p><b><u>LIVING THINGS AND THEIR HABITATS</u></b></p> <p>Know that living things move, grow, consume nutrients and reproduce; that dead things use to do these things, but no longer do; and that things that never lived have never done these things.</p> <p>Know that light is a form of energy.</p> <p>Know that plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals.</p> <p>Know that the arrows on a food chain show the</p>	<p><b><u>PLANTS</u></b></p> <p>Identify and describe the functions of different parts of flowering plants: roots stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the lifecycle of flowering plants, including pollination, seed</p>	<p><b><u>ANIMALS INCLUDING HUMANS</u></b></p> <p>Know the basic parts of the digestive systems including knowing that food passes through the body with the nutrients being extracted and the waste products excreted, and that this process is called digestion.</p> <p>Know that the process of digestion involves breaking complex foodstuffs into simpler building blocks that can be absorbed by the body.</p> <p>Know that the process of digestion begins with food being chewed in</p>	<p><b><u>ANIMALS INCLUDING HUMANS</u></b></p> <p>Know about the lifecycle of a human being.</p> <p>Know what the terms puberty, gestation and reproduction mean.</p> <p><b><u>LIVING THINGS AND THEIR HABITATS</u></b></p> <p>Know the life cycle of different living things, e.g. mammal, amphibian, insect and bird.</p>	<p><b><u>LIVING THINGS AND THEIR HABITATS</u></b></p> <p>Be able to classify living things into broad groups according to observable characteristics and based on similarities and differences.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Know about vertebrate and invertebrate animals.</p> <p>Know who Carl Linnaeus is.</p> <p><b><u>EVOLUTION AND INHERITANCE</u></b></p> <p>Know that Jane Goodall is an anthropologist, most famous</p>

<p><b>ELG: Managing Self</b></p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p>	<p>Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone.</p> <p>Know that reptiles are different to other animals in that they breathe air and have scaly skin.</p> <p>Know that birds are different to other animals in that they have feathers and wings (and name some common birds).</p> <p>Know that mammals are different to other animals in that they have fur/hair and they feed milk to their young.</p> <p>Know that feet, legs, arms, hands, torso, head, skin, ears, eyes, nose, mouth and tongue are parts of the body and identify them.</p> <p>Know that eyes are associated with sight, ears with sound, nose with smell, tongue with taste and skin with touch.</p> <p><b><u>PLANTS</u></b></p>	<p>direction that the energy travels.</p> <p>Know that polar bears are an example of an animal adapted to its environment – thick fur for warmth and oily paw pads to ensure that they don't freeze to the ice.</p> <p>Know that woodlice live under logs – an example of a microhabitat - as they need somewhere dark and damp so that they do not dry out.</p> <p><b><u>PLANTS</u></b></p> <p>Know that seeds and bulbs need to be buried underground in soil and that they will grow into adult plants under the right conditions (water, warmth).</p> <p>Know that plants that are deprived of light, food or air will not grow and will die.</p> <p>Know that plants and animals produce offspring that grow into adults.</p> <p><b><u>ANIMALS INCLUDING HUMANS</u></b></p> <p>Know that animals, including humans, need</p>	<p>formation and seed dispersal.</p> <p><b><u>ANIMALS INCLUDING HUMANS</u></b></p> <p>Know the names of the body parts associated with skeleton and muscles.</p> <p>Know that the body parts have special functions.</p> <p>Know what joints are and how they work.</p> <p>Compare the diet of different groups of animals, including humans.</p>	<p>the mouth by the teeth and saliva added.</p> <p>Teeth</p> <p>Know that a human has three types of teeth – incisors, canines and molars –and that these each perform different functions.</p> <p>Know that incisors slice food, canines tear food (especially meat) and that molars grind food.</p> <p><b><u>LIVING THINGS AND THEIR HABITATS</u></b></p> <p>Food chains start with a plants which is called a producer.</p> <p>Know that an animal that is eaten by another is called prey, and that an animal that eats other animals is called a predator.</p> <p>Know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behaviour (e.g. herbivores, carnivores and omnivores).</p> <p>Know that a classification key uses questions to sort and identify different living</p>	<p>Know about the process of reproduction in plants.</p> <p>Know about the process of reproduction in animals.</p>	<p>for her study of chimpanzees, of which she is considered the world's foremost expert.</p> <p>Know that Goodall discovered that chimpanzees are much more intelligent than they had ever been thought to be.</p> <p>Know that Goodall is also a conservationist and environmentalist, which means she does important work to help protect the planet, in particular animal habitats.</p> <p>Know that living things have changed over time.</p> <p>Know the part fossils play in helping us understand more about living things that inhabited our Earth millions of years ago.</p> <p>Know that living things produce off-spring of the same kind.</p> <p>Know that off- spring vary and are not normally identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p><b><u>ANIMALS INCLUDING HUMANS</u></b></p> <p>Know the names of key bones in the body, including the rib cage, cranium, mandible, sternum, vertebrae, femur,</p>
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	<p>Know a rose bush, a sunflower and a dandelion by sight (visit queens gardens to see plants).</p> <p>Know an oak tree, a birch tree and a horse chestnut tree by sight.</p> <p>Know that evergreen trees maintain their leaves throughout the year and that deciduous trees shed their leaves in autumn.</p> <p>Know that a flowering plant consist of roots, stem, petal, leaves and flowers, and that a tree's stem is called a trunk.</p>	<p>food, water and air to survive.</p> <p>Know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods.</p> <p>Know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth).</p> <p>Know that more than half of our diet should be made up of carbohydrates, fruit and vegetables.</p> <p>Know that fats and sugary foods should be eaten rarely and in small amounts.</p> <p>Know that people need to exercise often to help their body stay strong and fit.</p> <p>Know that keeping clean, including washing and brushing teeth, is an important part of staying healthy.</p>		<p>things (see diagram below).</p> <p>Know that a classification key uses questions to sort and identify different living things (see diagram below).</p> <p>Know how to use a classification key to identify living things.</p> <p>Know that the environment can be changed for good.</p> <p>Know that some changes to the environment can be a danger to living things.</p>		<p>tibia, fibula, patella, humerus, radius and ulna; know how to label these on a diagram of the human body.</p> <p>Know that an adult human body has 206 bones, the longest of which is the femur.</p> <p>Know that the heart and lungs are organs protected by the ribcage and understand this as a part of the skeleton.</p> <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Know the impact of diet, exercise, drugs and lifestyle on health.</p> <p>Know the ways in which nutrients and water are transported in animals, including humans.</p> <p>Know who William Harvey was.</p>
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**Earth Science**

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<p><u>Understanding the World</u></p> <p>Understand the effect of changing seasons on the natural world around them.</p> <p>ELG: The Natural World</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p><b><u>SEASONAL CHANGE</u></b></p> <p>Know that the four seasons are spring, summer, autumn and winter and know the order of the cycle.</p> <p>Know that weather changes through the year, getting hotter in the summer and colder in the winter.</p> <p>Know that days are longer in the summer and shorter in winter and know that in different parts of the world their seasons are at different times to us.</p> <p>Know that the Earth orbits the Sun with one orbit constituting a year of 365/366 days.</p>				<p><b><u>EARTH AND SPACE</u></b></p> <p>Know about and explain the movement of the earth and other planets relative to the sun.</p> <p>Know the sun, earth and moon are spherical bodies.</p> <p>Know about and explain the movement of the moon relative to earth.</p> <p>Know the sun, earth and moon are spherical bodies.</p> <p>Know that the Earth spins around an imaginary line through its centre called an axis and that this axis is tilted relative to the Earth's orbit.</p> <p>Know that night and day are the result of the Earth rotating on its axis.</p> <p>Know that Katherine Johnson was a scientist and mathematician from America.</p> <p>She worked for NASA and her calculations and work were critical to the success of the first and subsequent manned space flights.</p> <p>She was one of the first black women to attend an integrated university in her state, West Virginia, having been handpicked due to her ability.</p>	

# Programme of Study Progression of Vocabulary

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
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<b>B</b> <b>i</b> <b>o</b> <b>l</b> <b>o</b> <b>g</b> <b>y</b>	<b>A</b> <b>n</b> <b>i</b> <b>m</b> <b>a</b> <b>l</b> <b>s</b> <b>i</b> <b>n</b> <b>c</b> <b>l</b> <b>u</b> <b>d</b> <b>i</b> <b>n</b> <b>g</b> <b>H</b> <b>u</b> <b>m</b> <b>a</b> <b>n</b> <b>s</b>	<p><u>This is me</u> Baby Toddler Child Same Different Change Features</p> <p>Head, neck, face, shoulders, arms, legs, hands, feet, ankle, elbow, knee, fingers, toes, eyes, nose, mouth, chin, cheeks etc</p> <p><u>Farm Life</u> Farm, Farmyard, farmhouse Field Barn Stable Hay Haystack Pen Pigsty</p> <p>Environment same, similar, different</p> <p>Tractor Combine harvester Trailer Scarecrow</p> <p>Foal, lamb, calf, piglet, chick, gosling, duckling, kid</p> <p>Flock of sheep Herd of cows Gaggle of geese Crowd of people</p>	<ul style="list-style-type: none"> <li>• <u>Names of animal groups:</u> <b>fish, amphibians, reptiles, birds, mammals.</b></li> <li>• <u>Animal diets:</u> <b>carnivore, herbivore, omnivore.</b></li> <li>• <u>Human and animal body parts:</u> e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet, tail, wings, feathers, fur, beak, fins, gills.</li> <li>• <u>Human senses:</u> <b>sight, hearing, touch, smell, taste.</b></li> <li>• <u>Exploring senses:</u> loud, quiet, soft, rough.</li> <li>• <u>Other:</u> human, animal, pet.</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Being born and growing:</u> <b>Young, offspring, live young, grow, develop, change, hatch, lay, fly, crawl, talk.</b></li> <li>• <u>Young and adult names:</u> e.g. lamb and sheep, kitten and cat, duckling and duck.</li> <li>• <u>Life cycle stages:</u> e.g. baby, toddler, child, teenager, <b>adult;</b> frogspawn, tadpole, froglet, frog.</li> <li>• <u>Survival and staying healthy:</u> basic needs, survive, food, air, <b>exercise, diet, nutrition, healthy, balanced diet, hygiene, germs.</b></li> <li>• <u>Food groups:</u> fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar.</li> </ul> <p>Previously introduced vocabulary: <b>water.</b></p>	<ul style="list-style-type: none"> <li>• <u>Food groups and nutrients:</u> fibre, fats (<b>saturated and unsaturated</b>), vitamins, minerals.</li> <li>• <u>Skeletons and muscles:</u> skeleton, <b>muscles, tendons, joints,</b> protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, shell, <b>vertebrate, invertebrate,</b> endoskeleton, exoskeleton, hydrostatic skeleton.</li> <li>• <u>Names of human bones:</u> e.g. skull, spine, backbone, vertebral column, ribcage, pelvis, clavicle, scapula, humerus, ulna, pelvis, radius, femur, tibia, fibula.</li> <li>• <u>Other:</u> <b>energy.</b></li> </ul> <p>Previously introduced vocabulary: movement.</p>	<ul style="list-style-type: none"> <li>• <u>Digestive system:</u> <b>digest,</b> digestion, tongue, teeth, saliva, salivary glands, <b>oesophagus, stomach,</b> liver, pancreas, gall bladder, <b>small intestine,</b> duodenum, <b>large intestine, rectum,</b> anus, faeces, organ.</li> <li>• <u>Types of teeth and dental care:</u> <b>molar, premolar, incisor, canine,</b> wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth.</li> <li>• <u>Food chains and animal diets:</u> decomposer, food web.</li> </ul> <p>Previously introduced vocabulary: <b>producer, consumer, prey, predator,</b> excretion, habitat.</p>	<ul style="list-style-type: none"> <li>• <u>Process of reproduction:</u> <b>gestation, asexual reproduction, sexual reproduction,</b> sperm, egg, cells, clone.</li> <li>• <u>Changes and life cycle:</u> embryo, foetus, uterus, <b>prenatal, adolescence, puberty, menstruation, adulthood,</b> menopause, <b>life expectancy,</b> old age, hormones, sweat.</li> <li>• <u>Changing body parts:</u> e.g. breasts, penis, larynx, ovaries, genitalia, pubic hair.</li> </ul> <p>Previously introduced vocabulary: reproduction, <b>reproduce,</b> types of animals and animal groups, <b>fertilisation.</b></p>	<ul style="list-style-type: none"> <li>• <u>Circulatory system:</u> circulation, <b>heart,</b> pulse, heartbeat, heart rate, lungs, breathing, <b>blood vessels,</b> blood, pump, transported, <b>oxygenated blood, deoxygenated blood,</b> oxygen, arteries, veins, capillaries, chambers, plasma, platelets, white blood cells, red blood cells.</li> <li>• <u>Lifestyle:</u> <b>drug, alcohol,</b> smoking, disease, calorie, energy input, energy output.</li> <li>• <u>Other:</u> water transportation, nutrient transportation, waste products.</li> </ul> <p>Previously introduced vocabulary: carbon dioxide.</p>
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<p style="text-align: center;"><b>B i o l o g y</b></p>	<p style="text-align: center;"><b>L i v i n g T h i n g s a n d T h e i r H a b i t a t s</b></p>			<ul style="list-style-type: none"> <li>• <u>Living or dead:</u> <b>living, dead, never living,</b> not living, alive, never been alive, healthy.</li> <li>• <u>Habitats including microhabitats:</u> <b>depend,</b> shelter, safety, <b>survive,</b> suited, space, minibeast, air.</li> <li>• <u>Life processes:</u> movement, sensitivity, growth, reproduction, nutrition, excretion, respiration.</li> <li>• <u>Food chains:</u> <b>food sources,</b> food, producer, consumer, predator, prey.</li> <li>• <u>Names of habitats and microhabitats:</u> e.g. under leaves, woodland, rainforest, sea shore, ocean, urban, local habitat.</li> </ul> <p>Previously introduced vocabulary: senses, <b>carnivore, herbivore, omnivore, seed, water,</b> names of materials.</p>		<ul style="list-style-type: none"> <li>• <u>Living things:</u> <b>organisms, specimen,</b> species.</li> <li>• <u>Grouping living things:</u> <b>classification,</b> classification keys, classify, <b>characteristics.</b></li> <li>• <u>Names of invertebrate animals:</u> snails and slugs, worms, spiders, insects.</li> <li>• <u>Invertebrate body parts:</u> e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs.</li> <li>• <u>Environmental changes:</u> <b>environment,</b> environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, <b>endangered species, extinct.</b></li> </ul> <p>Previously introduced vocabulary: carbon dioxide, <b>fish, bird, mammal, amphibian, reptile,</b> skeleton, bone, <b>vertebrate, invertebrate,</b> backbone, names for animal body parts, names of common plants, photosynthesis.</p>	<ul style="list-style-type: none"> <li>• <u>Reproduction:</u> <b>asexual reproduction, sexual reproduction, gestation, metamorphosis,</b> gametes, tuber, runners/side branches, plantlet, cuttings, embryo, adolescent, penis, vagina, egg, pregnancy, gestation.</li> </ul> <p>Previously introduced vocabulary: <b>life cycle, pollination,</b> offspring, <b>fertilise,</b> fertilisation, sepal, filament, anther, stamen, pollen, petal, stigma, style, ovary, carpel, ovule, stem, bulb, roots, mammal, adult, baby, sperm, cells, live young.</p>	<ul style="list-style-type: none"> <li>• <u>Classifying:</u> Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation.</li> <li>• <u>Microorganisms:</u> <b>bacteria,</b> single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, <b>microscope,</b> decompose.</li> </ul>
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		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<b>B</b> <b>i</b> <b>o</b> <b>l</b> <b>o</b> <b>g</b> <b>y</b>	<b>E</b> <b>v</b> <b>o</b> <b>l</b> <b>u</b> <b>t</b> <b>i</b> <b>o</b> <b>n</b> <b>a</b> <b>n</b> <b>d</b> <b>I</b> <b>n</b> <b>h</b> <b>e</b> <b>r</b> <b>i</b> <b>t</b> <b>a</b> <b>n</b> <b>c</b> <b>e</b>							<ul style="list-style-type: none"> <li>• <b>Evolution and inheritance:</b> evolve, <b>adaptation</b>, inherit, <b>natural selection</b>, <b>adaptive traits</b>, <b>inherited traits</b>, mutations, theory of evolution, ancestors, biological parent, chromosomes, genes, Charles Darwin.</li> <li>• <b>Other:</b> selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA.</li> </ul> <p>Previously introduced vocabulary: classification, <b>offspring</b>, <b>characteristics</b>, <b>habitat</b>, <b>environment</b>, adapt, <b>variations</b>, human, <b>fossil</b>, suited, cells, names of different habitats, names of animals and their body parts, species, <b>sedimentary rock</b>, lava, <b>igneous rock</b>, <b>metamorphic rock</b>, <b>magma</b>, heat, <b>fossilisation</b>.</p>
		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<b>Ph</b> <b>y</b> <b>s</b> <b>i</b> <b>c</b> <b>s</b>	<b>Fo</b> <b>r</b> <b>c</b> <b>e</b> <b>s</b>				<ul style="list-style-type: none"> <li>• <b>How things move:</b> move, movement, <b>surface</b>, distance, strength.</li> <li>• <b>Types of forces:</b> push, pull, contact force, non-contact force, <b>friction</b>.</li> <li>• <b>Magnets:</b> <b>magnetic</b>, <b>magnetic field</b>,</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Types of forces:</b> <b>air resistance</b>, <b>water resistance</b>, <b>buoyancy</b>, <b>upthrust</b>, Earth's <b>gravitational pull</b>, <b>gravity</b>, opposing forces, driving force.</li> </ul>	

			<p>magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic <b>poles</b> (north pole, south pole), <b>attract, repel</b>, compass.</p> <ul style="list-style-type: none"> <li>• <u>Magnetic and non-magnetic materials</u>: e.g. iron, nickel, cobalt.</li> </ul> <p>Previously introduced vocabulary: metal, names of materials.</p>		<ul style="list-style-type: none"> <li>• <b>Mechanisms</b>: levers, pulleys, gears/cogs.</li> <li>• <u>Measurements</u>: <b>weight, mass</b>, kilograms (kg), Newtons (N), scales, speed, fast, slow.</li> <li>• <u>Other</u>: <b>streamlined</b>, Earth.</li> </ul> <p>Previously introduced vocabulary: air, heat, moon.</p>	
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		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
<b>Ph</b>	<b>Li</b>				<ul style="list-style-type: none"> <li>• <u>Light and seeing</u>: <b>dark</b>, absence of light, <b>light source</b>, illuminate, visible, <b>shadow</b>, <b>translucent</b>, energy, block.</li> <li>• <u>Light sources</u>: e.g. candle, torch, fire, lantern, lightning.</li> <li>• <u>Reflective light</u>: <b>reflect, reflection</b>, surface, <b>ray</b>, scatter, reverse, beam, angle, mirror, moon.</li> <li>• <u>Sun safety</u>: dangerous, glare, damage, UV light, UV rating, sunglasses, direct.</li> </ul> <p>Previously introduced vocabulary: <b>opaque, transparent</b>, sunlight, sun.</p>		<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Reflection</u>: periscope.</li> <li>• <u>Seeing light</u>: <b>visible spectrum, prism</b>.</li> <li>• <u>How light travels</u>: light waves, wavelength, straight line, <b>refraction</b>.</li> </ul> <p>Previously introduced vocabulary: names and properties of materials, absorb.</p>
<b>ysi</b>	<b>g</b>							
<b>cs</b>	<b>ht</b>							

		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Ph ysi cs	So un d					<ul style="list-style-type: none"> <li>• <u>Parts of the ear:</u> <b>eardrum.</b></li> <li>• <u>Making sound:</u> <b>vibration</b>, vocal cords, <b>particles.</b></li> <li>• <u>Measuring sound:</u> <b>pitch, volume, amplitude, sound wave</b>, quiet, loud, high, low, travel, <b>distance.</b></li> <li>• <u>Other:</u> <b>soundproof, absorb sound.</b></li> </ul>		

		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Ph ysi cs	Ea rth an d Sp ac e						<ul style="list-style-type: none"> <li>• <u>Solar system:</u> <b>star, planet.</b></li> <li>• <u>Names of planets:</u> Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus.</li> <li>• <u>Shape:</u> <b>spherical bodies, sphere.</b></li> <li>• <u>Movement:</u> <b>rotate, axis, orbit, satellite.</b></li> <li>• <u>Theories:</u> <b>geocentric model, heliocentric model, astronomer.</b></li> <li>• <u>Day length:</u> sunrise, sunset, midday, time zone.</li> </ul> <p>Previously introduced vocabulary: <b>Sun, moon, shadow</b>, day, night, heat, <b>light, reflect.</b></p>	

		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Ph ysi cs	Ele ctr icit y					<ul style="list-style-type: none"> <li>• <b>Electricity:</b> mains-powered, battery-powered, <b>mains electricity</b>, plug, <b>appliances</b>, devices.</li> <li>• <b>Circuits:</b> <b>circuit</b>, simple series circuit, complete circuit, incomplete circuit.</li> <li>• <b>Circuit parts:</b> bulb, cell, wire, buzzer, switch, motor, <b>battery</b>.</li> <li>• <b>Materials:</b> <b>electrical conductor</b>, <b>electrical insulator</b>.</li> <li>• <b>Other:</b> safety.</li> </ul> <p>Previously introduced vocabulary: names of materials.</p>		<ul style="list-style-type: none"> <li>• <b>Flow and measure of electricity:</b> <b>voltage</b>, <b>amps</b>, <b>resistance</b>, <b>electrons</b>, volts (V), <b>current</b>.</li> <li>• <b>Circuits:</b> <b>symbol</b>, circuit diagram, component, function, filament.</li> <li>• <b>Variations:</b> dimmer, brighter, louder, quieter.</li> <li>• <b>Types of electricity:</b> natural electricity, human-made electricity, solar panels, power station.</li> <li>• <b>Other:</b> positive, negative.</li> </ul>





**Progression of Vocabulary – Working Scientifically**

<b>KS1</b>	<b>LKS2</b>	<b>UKS2</b>
aim answers block diagrams changes compare describe difference different enquiry equipment experience explore findings gather group identify (name) investigate measure notice observe patterns pictograms questions record same similarity simple tables sort sorting diagrams tally charts test What will we do? (plan) What do you think will happen? (prediction) What happened? (results) What have we found out? (conclusion)	accurate bar chart chart classify comparative test conclusion (What have we found out?) criteria data develop diagram evaluate evidence explanation key making a test fair method observations plan (What will we do?) practical enquiry prediction (What do you think will happen?) primary sources questioning reasoning relationships results (What happened?) secondary sources standard units table What do we change, what do we keep the same, what are we measuring?	accuracy and precision bar graphs causal relationship degree of trust dependent variable independent variable justify line graphs refute repeat results scatter graphs support variables (what do we change, what do we keep the same, how and what are we measuring?)

